

CLAIMS

1. A semiconductor integrated circuit device comprising an output buffer circuit composed of a logic gate that receives data and a driver transistor that receives, at a control
5 electrode thereof, an output from the logic gate and that is driven according to the output from the logic gate,

wherein the logic gate

receives a selection control signal that varies magnitude of a composite resistance of an on-state resistance of a transistor constituting the logic gate, and

10 has a resistance value switching transistor that can be switched on/off by the selection control signal, and

wherein the resistance value switching transistor is switched on/off by the selection control signal to switch a rate of change of an output of the driver output transistor.

15 2. The semiconductor integrated circuit device according to claim 1,
wherein an output control signal that controls an output operation of the driver transistor is inputted to the logic gate,

wherein the logic gate includes

20 a first transistor that receives the output control signal at a control electrode thereof and a direct-current voltage at a first electrode thereof,

a switch that is switched on/off by the output control signal and that electrically connects/disconnects a second electrode of the first transistor and the control electrode of the driver transistor, and

the resistance value switching transistor receiving the direct-current voltage at a

first electrode thereof, having a second electrode connected to a node at which the second electrode of the first transistor and the switch are connected, and having an on-state resistance lower than the on-state resistance of the first transistor.

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3. The semiconductor integrated circuit device according to claim 2,

wherein, when an operation frequency of the output buffer circuit is high, the resistance value switching transistor is turned on, and

wherein, when the operation frequency of the output buffer circuit is low, the
10 resistance value switching transistor is turned off.

4. The semiconductor integrated circuit device according to claim 2,

wherein the first transistor and the resistance value switching transistor are MOS transistors, and

15 wherein a gate width of the first transistor is made narrower than a gate width of the resistance value switching transistor, or a gate length of the first transistor is made longer than a gate length of the resistance value switching transistor.

5. The semiconductor integrated circuit device according to claim 2,

20 wherein an output value determination signal that determines an output from the driver transistor is inputted to the logic gate and the output control signal disables/enables the output operation of the driver transistor,

wherein the logic gate includes

the first transistor, the switch, and the resistance value switching transistor that

use the direct-current voltage as a power supply voltage,
the first transistor, the switch, and the resistance value switching transistor that
use the direct-current voltage as a ground voltage, and
a selection switch that selects among outputs from the switch on a side of a
power supply voltage and from the switch on a side of a ground voltage
according to a value of the output value determination signal, and outputs the
selected output to the control electrode of the driver transistor.

6. The semiconductor integrated circuit device according to claim 5,
wherein the first transistor and the resistance value switching transistor which are on a
side of the power supply voltage are P channel MOS transistors, and
wherein the first transistor and the resistance value switching transistor which are on a
side of the ground voltage are N channel MOS transistors.

7. The semiconductor integrated circuit device according to claim 2,
wherein the switch is a second transistor receiving the output control signal at a
control electrode thereof, having a first electrode connected to the second electrode of the first
transistor, and having a second electrode connected to the control electrode of the driver
transistor.

8. The semiconductor integrated circuit device according to claim 1,
wherein the logic gate includes
a plurality of first transistors that have control electrodes serving as an input
and that are connected in series between the direct-current voltage and the output of the logic

gate, and

a plurality of said resistance value switching transistor receiving at first electrodes thereof the direct-current voltage applied thereto, having second electrodes connected to respective second electrodes of the first transistors, and having an on-state
5 resistance lower than an on-state resistance of the first transistors.

9. A semiconductor integrated circuit device comprising an output buffer circuit composed of a logic gate that receives data and a driver transistor that receives, at a control electrode thereof, an output from the logic gate and that is driven according to the output from
10 the logic gate,

wherein there are provided, within the output buffer circuit, a plurality of transistor switches that have different on-state resistances and that are connected between the output of the logic gate and the control electrode of the driver transistor, and

wherein one of the plurality of transistor switches is turned on to switch a rate of
15 change of an output of the driver output transistor.

10. The semiconductor integrated circuit device according to claim 9,
wherein, when the transistor switches are composed of a first transistor switch and a second transistor switch and an on-state resistance of the first transistor switch is higher than
20 an on-state resistance of the second transistor switch,

if an operation frequency of the output buffer circuit is low, the first transistor switch is turned on and the second transistor switch is turned off, and

if the operation frequency of the output buffer circuit is high, the first transistor switch is turned off and the second transistor switch is turned on.

11. The semiconductor integrated circuit device according to claim 9,
wherein, by making MOS transistors constituting each transistor switch have different
gate widths and different gate lengths, the transistor switches are made to have different on-
5 state resistances.

12. The semiconductor integrated circuit device according to one of claims 1 to 11,
wherein there are provided a plurality of said output buffer circuit.